

Date: Wednesday, 9/12/2007 11:13:29 AM
 User: Eric Charbonneau

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services

Job Number : 34637

Estimate Number : 13018

P.O. Number :

This Issue : 9/12/2007

S.O. No. :

Prsht Rev. : NC

First Issue : 1/1

Type : LANDING GEAR

Previous Run :

Written By : BC

Checked & Approved By :

Comment : Est Rev:A New Issue 07.09.12 EC verified by: JLM

Drawing Name : 212 X-TUBE ,LOW NARROW FWD

Part Number : D212664147

Drawing Number : D212-664-147 U/R

Project Number : LG0009

Drawing Revision : U/R

Material :

Due Date : 9/19/2007

Qty: 3 Um: Each

PROTOTYPE**FOR ENGINEERING USE ONLY**

Additional Product

Job Number:



Seq. #: Machine Or Operation: Description :

1.0 DC

DOCUMENT CONTROL



Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D212-664-147 CHG001

N/A CP 07.06.28

2.0 D6019128

Crosstube Material



Comment: Qty.: 1.0000 Each(s)/Unit Total: 2.0000 Each(s)

Pick:

Qty Part number Description Batch

1 D6019-128 Crosstube 29369

Check OD = 2.750"; ID = 2.125"

CERTIFICATE OF CONFORMITY
REQUIRED

SF 07/09/24

3.0 MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: 1-TURN AS PER FOLIO FA705 & DWG D212-664-147,

FOLIO REV: /

DWG REV: /

2-DEBURR AS REQUIRED

SF 07/09/24

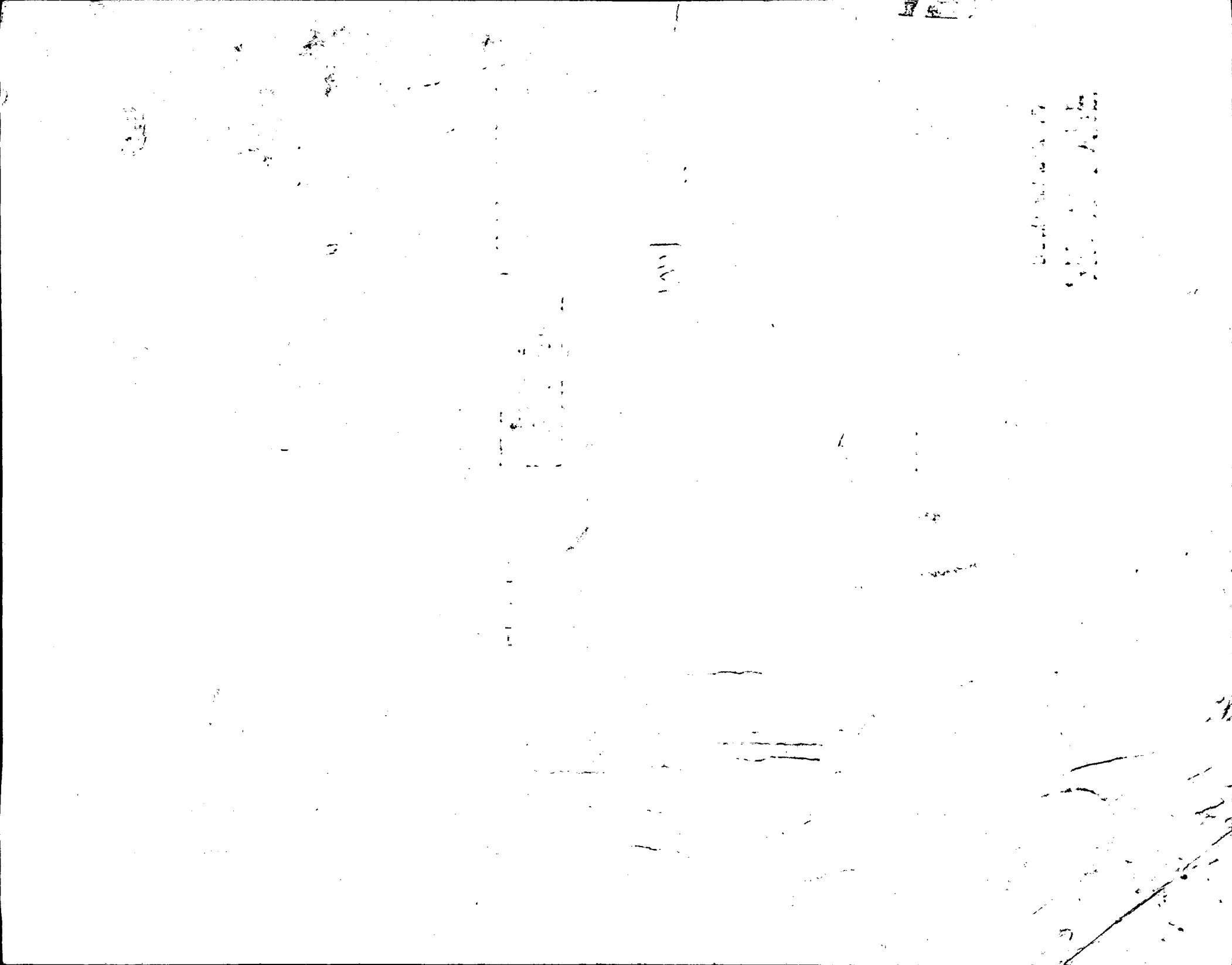
4.0 QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

SF 07/09/24



Date: Wednesday, 9/12/2007 11:13:30 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212 X-TUBE ,LOW NARROW FWD

Job Number: 34637

Part Number: D212664147

Job Number:



Seq. #: Machine Or Operation: Description :

5.0 QC8

SECOND CHECK



**ENGINEERING
APPROVAL**



Comment: SECOND CHECK

9.07.09.03 (3)

6.0 LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Polish entire outside surface of crosstube

JD 7-9-20 (3)

7.0 QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

9.07.09.20 (3)

8.0 HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

JD 7-9-20 (3)

9.0 QC3/5

INSPECT WORK/WING WALK



Comment: Inspect work & Chemical conversion Coat

QC3 / QC5 9.07.09.24 (3)

10.0 BENDING

BENDING MACHINE



B/N 34637-1 EL 7-9-24 (3)



Comment: BENDING MACHINE

Bend tube as per Dwg D412-664-243 using CNC bender program 412-af and Folio FT010

11.0 QC6

DIMENSIONAL CHECK



**ENGINEERING
APPROVAL**



Comment: DIMENSIONAL CHECK

B/N 34637-1 9.07.09.24 (1)

12.0 D36591

CUFF



Comment: Qty.: 2.0000 Each(s)/Unit Total: 4.0000 Each(s)

CUFF

Batch: 34706²

9.07.09.22

CERTIFICATE OF CONFORMITY
REQUIRED

Date: Wednesday, 9/12/2007 11:13:30 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212 X-TUBE ,LOW NARROW FWD

Job Number: 34637

Part Number: D212664147

Job Number:



Seq. #: Machine Or Operation: Description :

13.0 LANDING GEAR 1 LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill Rivet holes as per Dwg D212-664-147 using DT8972.

2-Drill pilot holes in tube as per Dwg D212-664-147

3-Ream hole to finish size in tube as per Dwg D212-664-147

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-147

25 07-09-22

25 0707-21

14.0 HAND FINISHING1 HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat Tube & Cuffs as per QSI 005 4.1

25 07-09-21

15.0 QC3 INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

BN 34637-1 25 07-09-21

16.0 QC5 INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

BN 34637-1 25 07-09-21

17.0 OUTSIDE SERV.10 OUTSIDE SERVICES -LG



Comment: Sub-Contracting OUTSIDE SERVICES

Liquid Penetrant Inspection as per QSI 0380r

Issue P/O: LPI as per ASTM 1417

Level 2 Attach copy of NDT results to work order

N/A 25 07-09-21

18.0 PACKAGING.1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage

Ensure copy of NDT results attached to work order.

N/A 25 07-09-21

Date: Wednesday, 9/12/2007 11:13:30 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212 X-TUBE ,LOW NARROW FWD

Job Number: 34637

Part Number: D212664147

Job Number:



Seq. #:

Machine Or Operation:

Description :

19.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: Inspect for damage & ensure results are as per Dwg D412-664-203

N/A 07.09.22

20.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Rivet Cuffs as per Dwg D212-664-147. with Sika flex in Between tube & Cuff

A/R SIKAFLEX -241/-291

BATCH:

105 488

25 07 09-22

21.0

CR3212408

CHERRY RIVET



Comment: Qty.: 44.0000 Each(s)/Unit Total : 88.0000 Each(s)

CHERRY RIVET

Batch:

104 071 22

25 07 09-22

22.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1 Prime inside and outside crosstube as per QSI 005 4.2

25 07 09-22

2 Paint outside crosstube with White Imron as per QSI 005 4.2

N/A 07.09.22

23.0

QC14

INSPECT SPRAY PAINT



Comment: Inspect Spray Paint

Wrap in plastic bag to protect from scratches

N/A 07.09.22

24.0

D28931

Support

CERTIFICATE OF CONFORMITY
REQUIRED



Comment: Qty.: 2.0000 Each(s)/Unit Total : 4.0000 Each(s)

Support

B33560

25 07 09-22

Date: Wednesday, 9/12/2007 11:13:30 AM
User: Eric Charbonneau

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212 X-TUBE ,LOW NARROW FWD

Job Number: 34637

Part Number: D212664147

Job Number:



Seq. #: Machine Or Operation: Description :

25.0 D3595063450 Rubber Cushion (per sq ft)



Comment: Qty.: 0.8295 sf(s)/Unit Total : 1.6590 sf(s)

Rubber Cushion

Cut to .630" X 4.5" Qty 4

Batch: 33833

CERTIFICATE OF CONFORMITY
REQUIRED

RT 07-09-23

26.0 MS2192025 Clamp(per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 8.0000 Each(s)

Clamp

Batch: M104902

RT 07-09-23

27.0 LANDING GEAR 1 LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

Assemble as per Dwg D212-664-147

Instal support with magnobond 6398 per dwg D212-664-147,
cure for 12hrs before packaging.

Time & date of application: 12:00 07-09-23

Batch: 104723

RT 07-09-23

28.0 QC5 INSPECT WORK TO CURRENT STEP



ENGINEERING
APPROVAL



Comment: INSPECT WORK TO CURRENT STEP

R/N 34637-1 07.09.24

29.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Identify and pack for shipping as per PPP-D212-664-147

FOR ENGINEERING USE ONLY

N/A 07.09.24

30.0 QC21 FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

FOR ENGINEERING USE ONLY

QTY. 1 07.09.25

Job Completion



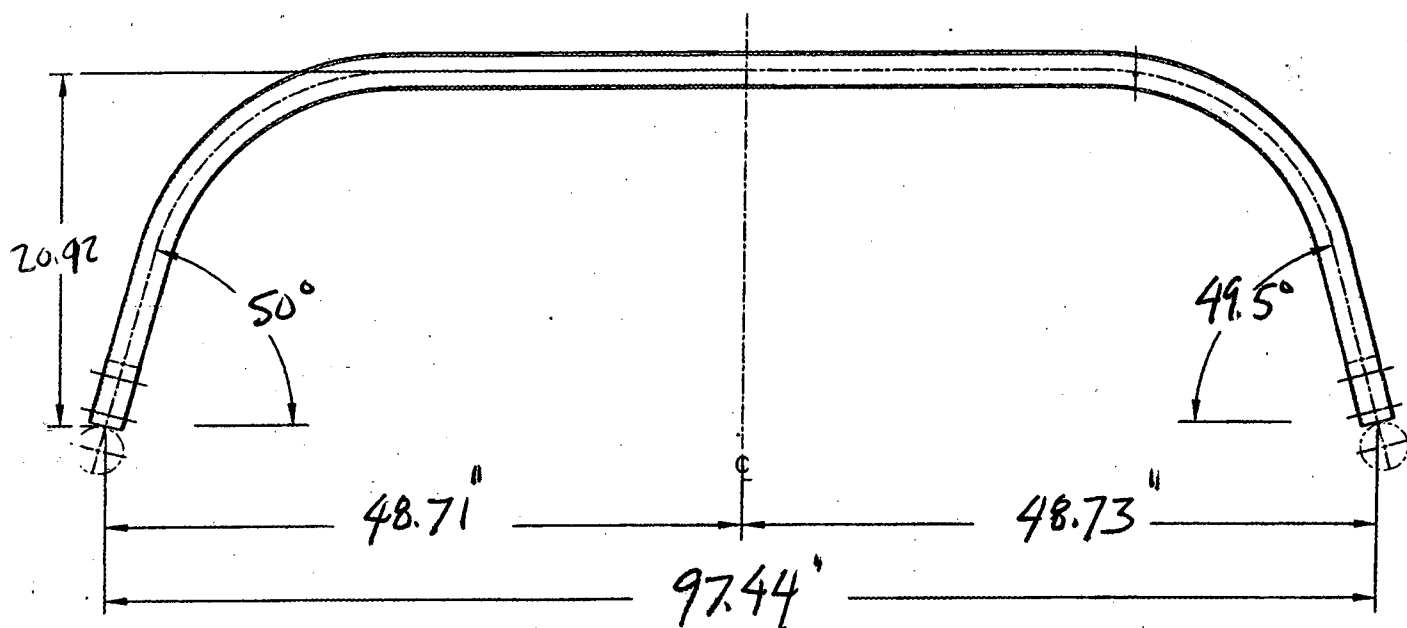
00206

07.09.26

07.06.24 34637-1 (A) (B)

DART AEROSPACE LTD		Work Order: 34637 HZ
Description: 212/412 LOW FWD		Part Number: D212-664-147
Inspection Dwg: D212-664-147 Rev: A Preliminary		Page 1 of 1

Required Dimension	Min	Max
Height		
1/2 Span		
Angle		
Total Span		



Comments

QC15 Inspection	UP
Date	07.09.23

Rev	Date	Change	Revised by	Approved
A		New Issue		
B	06.09.19	Reformat; QC level revised	KJ/JM	
C	07.02.06	Reformat	KJ/JM	

DART AEROSPACE LTD	Work Order: 300206-1
Description: Crosstube Assembly	Part Number: 34637 A
Inspection Dwg: 0212-664-147 Rev: 1	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST



First Article



Prototype


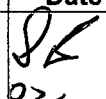
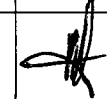
Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.673	+0.005 -0.000	2.675	/		
	2.573	"	2.575	/		
	2.473	"	2.475	/		
	2.366	"	2.368	/		
	2.360	"	2.362	/		
	2.750 stalk	+0.020	2.752	/		
SIDE B	126.53	+0.020	126.53	/		
	2.673	+0.005-0.000	2.675	/		
	2.573	"	2.575	/		
	2.473	"	2.475	/		
	2.366	"	2.368	/		
	2.360	"	2.362	/		
	2.750 stalk	+0.020	2.752	/		

Measured by: JS	Audited by: J.F.	Prototype Approval: [Signature] N/A
Date: 07/08/28	Date: 07/09/24	Date: 07.09.24
Rev	Date	Change
A		New Issue
		Revised by KJ/JLM
		Approved

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
07/05/30		Tube was jumping in the Jaws and it leave a Step Mark on the tube. Because not the good Tape per Inch.		Acceptable for testing	 07/04/30	N/A	 07.04.25	
		action do another set of jaws, with the good Tape per Inch. BIN 34637-1						

NOTE: Date & initial all entries

PARTS LIST:


Qty	Part Number	Description
X	D212-664-147	CROSSTUBE ASSEMBLY (205/212/412 LOW FWD)
1	D6019-128	CROSSTUBE
2	D2893-1	SUPPORT
4	D3595-063-450	RUBBER CUSHION
2	D3659-1	CUFF
4	MS21920-25	CLAMP (OR MS21920-26)
44	CR3212-4-06	RIVET (OR M7885/3-4-06)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6019-128
FINISHED LENGTH = 126.53 ± 0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) ALL DIMENSIONS ARE IN INCHES
- 5) PART IS SYMMETRIC ABOUT CENTERLINE.
- 6) WHEN MACHINING TAPER, RUN-OFF PART AT STOCK. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 7) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 8) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 9) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 14) INSTALL D3659-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 15) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

PRELIMINARY ISSUE

07.07.26

A	07.07.07	NEW ISSUE
DESIGN	DRAWN BY	 DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
CHECKED	APPROVED	DRAWING NO. D212-664-147
DATE	07.07.07	TITLE CROSSTUBE (205/212/412 LOW FWD)
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.		REV. A SHEET 1 OF 3 SCALE 1:8

